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TAMAN KAJANG UTAMA
43000 KAJANG, SELANGOR

DR SHARIFAH HAFIZAH
BINTI SYED ARIFFIN
Nama Penyelia

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Date : 07 MAY 2008

UTM SECURITY ENTRANCE USING RFID SYSTEM

FAZLINA ZURIA BINTI MOHD ANUAR

A thesis submitted in partial fulfillment of the
requirements for the award of the degree of
Bachelor of Electrical Engineering (Telecommunication)

Faculty of Electrical Engineering
Universiti Teknologi Malaysia

MAY 2008

I declare that this thesis entitled UTM Security Entrance using RFID System is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : .....

Name : FAZLINA ZURIA BINTI MOHD ANUAR

Date : 07 MAY 2008

Specially Dedicated to

My beloved father, mother, sisters, brothers and him

Thank you for the never-ending support, encouragement and inspiration

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ABSTRACT

This project is focusing on developing UTM Security Entrance System using Radio Frequency Identification (RFID) technology. At the moment, the Security Department monitors the incoming and outgoing traffic manually by looking at the sticker. This is a problem during peak hours where traffic arrival is heavy and delay increases. More over, there is no monitoring for records of the incoming and outgoing traffic at the entrance. Hence, an effective system is needed to record the incoming and outgoing traffic at the entrance of UTM. RFID is used to track objects using radio frequency. This project will applied RFID to track the vehicle at the entrance. The objective of this project is to develop an easy and efficient system for the Security Department to monitor and record the incoming and outgoing traffic and reduce the time taken by staff and students during entering UTM especially in peak hours. The system consists of tag, reader and host computer. The Microsoft SQL Server is used to create database and Microsoft Visual Basic 6.0 is used to interface the system with user. The result obtained is a user friendly system that displays appropriate information and records it in the database simply by user touch the tag at the reader. This system will not just omit the bottle neck at the entrance but also make a better record of UTM security system for UTM Security Department.

ABSTRAK

Projek ini difokuskan untuk membangunkan Sistem Keselamatan Pintu Masuk UTM menggunakan teknologi pengenalan radio frekuensi (RFID). Pada masa sekarang, Jabatan Keselamatan memantau lalulintas keluar dan masuk secara manual dengan memeriksa stiker. Ini menimbulkan masalah semasa waktu puncak di mana kelewatan sering berlaku. Lebih dari itu, tiada rekod lalulintas keluar dan masuk di pintu masuk UTM. Oleh sebab itu, satu sistem yang efektif diperlukan untuk merekod lalulintas keluar dan masuk di pintu masuk UTM. RFID digunakan untuk mengesan objek menggunakan radio frekuensi. Oleh itu, projek ini mengaplikasikan RFID untuk mengesan kenderaan di pintu masuk. Objektif projek ini adalah untuk membangunkan sistem yang mudah dan efisyen untuk Jabatan Keselamatan memantau dan merekod lalulintas keluar dan masuk dan mengurangkan masa yang diambil oleh staf dan pelajar semasa memasuki UTM terutama waktu puncak. System ini terdiri daripada label, pembaca dan komputer. Microsoft SQL Server digunakan untuk membangunkan pengkalan data dan Microsoft Visual Basic 6.0 digunakan untuk menjadi antara muka sistem dengan pengguna. Keputusan yang diperolehi adalah satu sistem mesra pengguna yang memaparkan informasi yang berkenaan dan merekod informasi tersebut di dalam pengkalan data hanya dengan pengguna menyentuh label pada pembaca. Sistem ini bukan sahaja mengelakkan kesesakan di pintu masuk, tetapi juga merekod dengan baik sistem keselamatan UTM untuk Jabatan Keselamatan UTM.

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CHAPTER 1

INTRODUCTION

1.1 Overview

Radio Frequency Identification (RFID) uses radio frequency communication to automatically identify, track and manage objects, people or animals. It is a method of remotely storing and retrieving data using devices called RFID tags which can be attached to a product that is need to be identify, track or manage. RFID system is made up of three parts which is a tag, reader and host computer. The tags require a unique identification number and contain antenna to enable them to receive and respond to radio frequency queries from the RFID reader. The RFID reader function is to extract the unique identification number from the tags and send it to the host computer so that it can be manipulate by the host computer according to the desired application.

Nowadays, RFID technology is being used widely in many applications such as transport payment, product tracking, automotive, animal identification, human implants and also in libraries. In Malaysia, the example of a system that applies RFID technology is Malaysia Expressways payment system which also known as Touch 'n Go. Due to the name and design, the user must touch the smart card to the RFID reader to make payment when they use the expressways. Singapore also uses

this technology for their public transport payment such as buses and trains known as EZ-Link cards. Moreover, RFID technology are used in library book or bookstore tracking, pallet tracking, building access control, airline baggage tracking, and apparel and pharmaceutical items tracking. UTM's library also replace the used of barcode with RFID technology to track books. Those applications show how useful the RFID technology nowadays.

Since, the widely and potential used of the RFID technology, this project implements the RFID technology to monitor the incoming and outgoing traffic at the UTM's entrance. Every staff and students of UTM will be provided with a smart card which is the RFID tag when they register their vehicle. The tags will store unique id number that indicates the owner and the detail of the vehicle. Then the RFID reader will read the tag and send the information to the host computer using serial interface. The host computer will receive and compare the unique id number with the database. If the tag is registered and valid in the database, the host computer will displays related information such as user name, vehicle registration number, UTM ID, date and time and then record the details in the database. But, if the tag is not valid, it will display "Invalid ID".

1.2 Problem Statement

The UTM Security Entrance using RFID System project is proposed after concerning the UTM security and problems that face by the Security Department, Staff and Students during entering UTM. It is a troublesome for the security officer to monitor the incoming and outgoing traffic by stand at the entry gate and check every vehicle manually whether it has registered sticker or not. More over, this will cause delays especially during peak hour. The security officer also faced problem to identify whether the sticker is original and whether they are valid or not.

On the other side, the staffs and student also facing problem during enter UTM. There is usually a bottle neck at the main entrance due to security reasons especially during peak hour. For this reason, it is a waste of time for staff and student entering UTM. Even though they have already display the registered car sticker but still they have to wait and queue up to enter UTM same as the visitors.

Hence, a convenient system is needed to monitor and record the incoming and outgoing traffic at the UTM entrance that can give benefits not just for the Security Department, but also the staff and students of UTM.

1.3 Objective of Project

The objective of this project is to develop an easy and efficient system for Security Department to monitor and record the car entry into UTM. The proposed project is applied RFID technology in the system. So, the reader must be able to grab the unique id from the tag that indicates every user of the system. The host computer must be able to receive the unique id from the reader and compare it with the database. It also must display appropriate information of the user and record the details for further used. By completing the project, perhaps, this system will also reduce the time taken by staff and students during entering UTM.

1.4 Scope of Project

This project is proposed after concerning the difficulties faced by the staff and student due to the poor of monitoring system used by the Security Department at

the entrance, therefore, the user of the proposed system will be only staff and students of UTM and the administrator of the system.

This project is divided into two parts which is hardware and software development and both of these parts is interfaces at the end of this project. For hardware development, the RFID system that consists of tag and reader is adjusted so that it is function according to the proposed application.

The development process is more focusing on the software. The system needs a database to store all the user information so the database is built using Microsoft SQL Server. After that, the programming to monitor the system is created by using Microsoft Visual Basic 6.0. Lastly, to complete this project, interface between the RFID system and the host computer is done using serial interface.

1.5 Thesis Outline

This report consists of five chapters. Chapter 1 briefly explains the development of the UTM Security Entrance using RFID system. It describes the reason and the objective of developing this project and as well as the scope of project that involved while the system was developed.

Chapter 2 clarify on literature review and theories involved in completing this project. It is includes about the RFID, the database and the Graphical User Interface (GUI). Then, Chapter 3 elaborates the methodology that is used during the development of this project. Start from the hardware development, creating database, creating the GUI and lastly interface between them.

Chapter 4 discussed the result obtained after this project had been completed. It includes the GUI for the system that shows it is successful communicate with the database and hardware. Finally, Chapter 5 explains the discussion, conclusion and some recommendation for further development of this project.

CHAPTER 2

THEORY AND LITERATURE REVIEW

2.1 Introduction

Some background studies on the field related to the project is essential in order to accomplish the objective successfully. As this project involves the knowledge about Radio Frequency Identification (RFID), database and a programming language to create the Graphic User Interface (GUI), this chapter reviews the literature all of the above mentioned.

2.2 Radio Frequency Identification (RFID)

2.2.1 The RFID Systems

The history of RFID starts during World War II the British. A system was developed to differentiate between their returning aircraft and those of the enemy

since the coast of occupied France was less than 25 miles away. A transponder was placed on Allied aircraft so that by giving the appropriate response to an interrogating signal, a friendly aircraft could automatically be distinguished from a foe. This was the IFF or Identify: Friend or Foe system upon which present day commercial and private aviation traffic control is still based. It was the first obvious use of RFID.

Generally, RFID is a system that use radio frequency to identify, locate and track people, assets and animals. There are several methods of identification, but the most common is to store a unique serial number that identifies a person or object on a microchip that is attached to an antenna. The combined antenna and microchip are called RFID transponder or RFID tag which work in combination with the RFID reader (sometimes called RFID interrogator).

The RFID system consists of a reader and one or more tags. The antenna of the reader is used to transmit radio frequency (RF) signal to the tag. Depending on the tag type, the signal is receive by the antenna of the tag and used to power up the internal circuitry of the tag. The tag will then modulate the electromagnetic waves generated by the reader in order to transmit its data back to the reader. The reader receives the modulated waves and converts them into digital data and sent to the output device depends on its application.

2.2.2 The RFID Tag

There are three types of RFID tag which is passive tag, active tag and semi passive tag. Passive tag refers to RFID tag which is powered solely by the RFID reader. The reader emits a radio frequency (RF), which powers the silicon chip on the tag when it is within range of the RF signal. When the power to the silicon chip

on the tag meets the minimum voltage threshold it require to turn on, the silicon chip can then send back information on the same RF wave. Range is usually limited to several meters.

Active tag refer to RFID tags which have their own power source, so they can receive a weaker signal from the reader, and the power source on the tag boosts the return signal. These types can have ranges of many tens of meters and even hundreds of meters, but will cost more because of their size and sophistication. Battery life can also limit the life of the tag. Meanwhile, semi passive tag refer to tag with a power source (usually a laminar, flexible, low cost battery) which can be used for tag sensing, but not to boost range. Figure 2.1 shows the example of RFID tags.

Figure 2.1 The example of RFID tags

2.2.3 The RFID Reader

RFID reader is use to extract data from RFID tag. It consists of radio circuitry (RFID Antenna) for generation and detection of radio waves, computational device for basic processing and filtering of signals such as the microcontroller. The radio circuitry section includes an RF carrier generator, antenna and a tuning circuit. The antenna and its tuning circuit must be properly

designed and tuned for the best performance. Figure 2.2 shows the example of RFID reader.

Figure 2.2 The example of RFID reader

2.2.4 The RFID Frequency

Frequency refers to the size of the radio waves used to communicate between the RFID systems components. Just as tuning the radio to different frequencies in order to hear different radio stations, RFID tag and reader have to be tuned to the same frequency in order to communicate effectively. RFID systems typically use one of the following frequency ranges: low frequency (or LF, around 170 kHz), high frequency (or HF, around 13.56 MHz), ultra-high frequency (or UHF, around 868 and 928 MHz), or microwave (around 2.45 and 5.8 GHz). It is generally safe to assume that a higher frequency equates to a faster data transfer rate and longer read ranges, but also more sensitivity to environmental factors such as liquid and metal that can interfere with radio waves. Table 2.1 shows some example of the frequency range and read range between the tag and the reader.

Table 2.1 The read range between the reader and tag

Frequency Bands	Antenna Components	Read Range (typical)
Low Frequency (125 - 400) kHz	Coil (> 100 turns) and capacitor	Proximity (8")
Medium Frequency (4 MHz - 24 MHz)	Coil (< 10 turns) and capacitor	Medium (15")
High Frequency (>900 MHz)	E-field dipole (a piece of conductor)	Long (> 1 m)

2.2.5 Basic Operation of RFID Systems using Passive Tag

The basic operation of RFID system starts when tag is energized by a time-varying electromagnetic radio frequency (RF) wave that is transmitted by the reader. This RF signal is called a carrier signal. The tag is composed of an antenna coil and a silicon chip that includes basic modulation circuitry and non-volatile memory.

When the RF field passes through an antenna coil, there is an AC voltage generated across the coil. This voltage is rectified to result in a DC voltage for the device operation. The device becomes functional when the DC voltage reaches a certain level. The information stored in the device is transmitted back to the reader. This is often called backscattering. By detecting the backscattering signal, the information stored in the device can be fully identified by the reader. Because the passive tag is remotely powered by reader's RF signal, it deals with very small power (~ μw). Thus, the read range (communication distance between reader and tag) is typically limited within a proximity distance [1].

Data decoding for the received signal is accomplished using a microcontroller in the reader. The firmware algorithm in the microcontroller is written in such a way to transmit the RF signal, decode the incoming data and communicate with the host computer. Figure 2.3 shows the basic operation of RFID system.

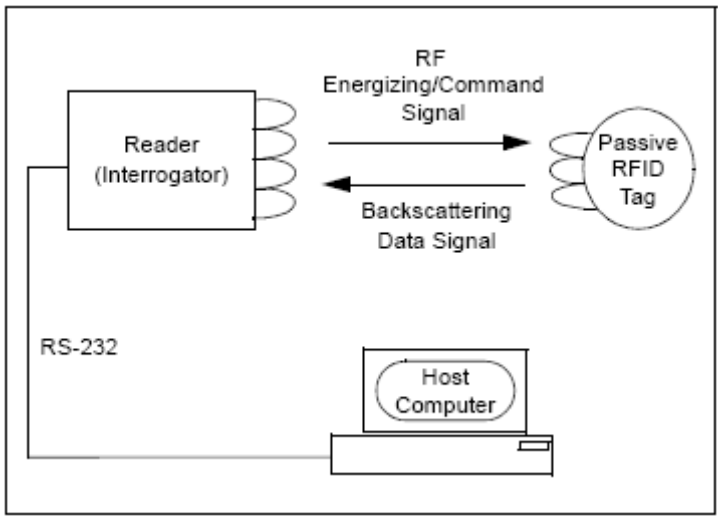


Figure 2.3 Basic Operation of RFID System

2.2.6 The applications of RFID

Nowadays, RFID is being used widely in many applications such as transport payment, product tracking, automotive, animal identification, human implants and also in libraries.

Moreover, high frequency RFID tags are used in library book or bookstore tracking, pallet tracking, building access control, airline baggage tracking, and apparel and pharmaceutical items tracking. High-frequency tags are widely used in identification badges, replacing earlier magnetic stripe cards. These badges need

only be held within a certain distance of the reader to authenticate the holder. The American Express Blue credit card now includes a high-frequency RFID tag.

The uniqueness of RFID tags means that a product may be individually tracked as it moves from location to location, finally ending up in the consumer's hands. This may help companies to combat theft and other forms of product loss. It has also been proposed to use RFID for point-of-sale store checkout to replace the cashier with an automatic system which needs no barcode scanning.

2.2.7 The advantages of RFID

There are many potential used of RFID such as RFID tag are often envisioned as a replacement for bar-codes, having a number of important advantages over the older bar-code technology. RFID codes are long enough that every RFID tag may have a unique code, while current barcodes are limited to a single code for all instances of a particular product.

Another significant advantage of all types of RFID systems is the non contact, non-line-of-sight nature of the technology. Tags can be read through a variety of substances such as snow, fog, ice, paint, crusted grime, and other visually and environmentally challenging conditions, where barcodes or other optically read technologies would be useless.

RFID tag can also be read in challenging circumstances at remarkable speeds, in most cases responding in less than 100 milliseconds. The read and write capability of an active RFID system is also a significant advantage in interactive applications such as work-in-process or maintenance tracking. Though it is a costlier technology (compared with barcode), RFID has become indispensable for a

wide range of automated data collection and identification applications that would not be possible otherwise.

2.3 Database Management System (DBMS)

A database management system (DBMS) is computer software designed for the purpose of managing databases based on a variety of data models. DBMS is a complex set of software programs that controls the organization, storage, management, and retrieval of data in a database. DBMS are categorized according to their data structures or types, some time DBMS is also know as Data base Manager. It is a set of prewritten programs that are used to store, update and retrieve a database.

A DBMS includes a modeling language to define the schema of each database hosted in the DBMS, according to the DBMS data model. The four most common types of organizations are the hierarchical, network, relational and object models. Inverted lists and other methods are also used. A given database management system may provide one or more of the four models. The optimal structure depends on the natural organization of the application's data, and on the application's requirements which include transaction rate (speed), reliability, maintainability, scalability, and cost.

DBMS also includes data structures (fields, records, files and objects) optimized to deal with very large amounts of data stored on a permanent data storage device, a database query language and report writer to allow users to interactively interrogate the database, analyze its data and update it according to the user’s privileges on data. It is also controls the security of the database. Data security prevents unauthorized users from viewing or updating the database. Using

passwords, users are allowed access to the entire database or subsets of it called subschemas. For example, an employee database can contain all the data about an individual employee, but one group of users may be authorized to view only payroll data, while others are allowed access to only work history and medical data.

DBMS also allows transaction mechanism to ensure data integrity, despite concurrent user accesses (concurrency control), and faults (fault tolerance). It also maintains the integrity of the data in the database. The DBMS can maintain the integrity of the database by not allowing more than one user to update the same record at the same time. The DBMS can help prevent duplicate records via unique index constraints; for example, no two customers with the same customer numbers (key fields) can be entered into the database.

The DBMS accepts requests for data from the application program and instructs the operating system to transfer the appropriate data. When a DBMS is used, information systems can be changed much more easily as the organization's information requirements change. New categories of data can be added to the database without disruption to the existing system. Organizations may use one kind of DBMS for daily transaction processing and then move the detail onto another computer that uses another DBMS better suited for random inquiries and analysis. Overall systems design decisions are performed by data administrators and systems analysts. Detailed database design is performed by database administrators.

Database servers are specially designed computers that hold the actual databases and run only the DBMS and related software. Database servers are usually multiprocessor computers, with disk arrays used for stable storage. Connected to one or more servers via a high-speed channel, hardware database accelerators are also used in large volume transaction processing environments. DBMSs are found at the heart of most database applications. Sometimes DBMSs are built around a private multitasking kernel with built-in networking support although nowadays these functions are left to the operating system.

There are many software programming that can be used to create the DBMS such as Microsoft Access, Oracle, Microsoft SQL Server and etc. Microsoft SQL Server is used to create DBMS for this project because its can provide data layer and can interact with Microsoft Visual Basic 6.0. Microsoft SQL Server is used to store all the information needed and the data will be manipulated using the Graphic User Interface (GUI) in Microsoft Visual Basic 6.0 application. Other products like Visual Studio® .NET and C++ can also interact with Microsoft SQL Server. The strength of Microsoft SQL Server is its more robust data integrity, scalability, security, and manageability [2].

Basically, Microsoft SQL Server client/server communication works start with client software communicates with SQL Server by sending requests and receiving data from the server. The client makes requests, and the server responds. It turns out that this communication has to pass through a series of connectivity layers on the client, from the application down to the network level, and then back up again through a parallel series of layers on the server side.

In the process, the request must be wrapped with instructions to the server on how to decode it, and similarly the results coming back from the server must be decoded and unpacked on the client machines.

2.4 Graphical User Interface (GUI)

Graphical User Interface (GUI) is a type of user interface which allows people to interact with a computer and computer-controlled devices. It presents graphical icons, visual indicators or special graphical elements. Often the icons are used in conjunction with text, labels or text navigation to fully represent the information and actions available to a user. But instead of offering only text menus,

or requiring typed commands, the actions are usually performed through direct manipulation of the graphical elements [3].

The term GUI is historically restricted to the scope of two-dimensional display screens with display resolutions capable of describing generic information, in the tradition of the computer science research at Palo Alto Research Center (PARC) (formerly Xerox PARC and still a subsidiary of Xerox). The term GUI might not apply to other high-resolution types of interfaces that are non-generic, such as videogames, or not restricted to flat screens, like volumetric displays. The precursor to GUIs was invented by researchers at the Stanford Research Institute, led by Douglas Engelbart. They developed the use of text-based hyperlinks manipulated with a mouse for the On-Line System. The concept of hyperlinks was further refined and extended to graphics by researchers at Xerox PARC, who went beyond text-based hyperlinks and used a GUI as the primary interface for the Xerox Alto computer. Most modern general-purpose GUIs are derived from this system.

Designing the visual composition and temporal behavior of GUI is an important part of software application programming. Its goal is to enhance the efficiency and ease of use for the underlying logical design of a stored program, a design discipline known as usability. Techniques of user-centered design are used to ensure that the visual language introduced in the design is well tailored to the tasks it must perform.

Typically, the user interacts with information by manipulating visual widgets that allow for interactions appropriate to the kind of data they hold. The widgets of a well-designed interface are selected to support the actions necessary to achieve the goals of the user. A Model-view-controller allows for a flexible structure in which the interface is independent from and indirectly linked to application functionality, so the GUI can be easily customized. This allows the user to select or design a different skin at will, and eases the designer's work to change the interface as the user needs evolve. Nevertheless, good user interface design relates to the user, not

the system architecture. The visible graphical interface features of an application are sometimes referred to as chrome. Larger widgets, such as windows, usually provide a frame or container for the main presentation content such as a web page, email message or drawing. Smaller ones usually act as a user-input tool.

A GUI may be designed for many requirements of a vertical market. This is known as an application specific graphical user interface. The examples of GUI applications are touch screen point of sale software used by wait staff in a busy restaurant, self-service checkouts used in a retail store, automated teller machines (ATM), airline self-ticketing and check-in, information kiosks in a public space like a train station or a museum and monitors or control screens in an embedded industrial application which employ a real time operating system. The latest cell phones and handheld game systems also employ application specific touch screen GUIs.

Microsoft Visual Basic 6.0 was designed to be easy to learn and use. The language not only allows programmers to create simple GUI applications, but can also develop complex applications as well. Programming in Microsoft Visual Basic 6.0 is a combination of visually arranging components or controls on a form, specifying attributes and actions of those components, and writing additional lines of code for more functionality. Since default attributes and actions are defined for the components, a simple program can be created without the programmer having to write many lines of code. Performance problems were experienced by earlier versions, but with faster computers and native code compilation this has become less of an issue.

Microsoft Visual Basic 6.0 is designed to allow the program run under the windows without the complexity generally associated with windows programming. The designed screen can holds standard windows button such as command buttons, check boxes, option buttons, text boxes, and so on. Each of these windows object, operates as expected, producing a “standard” windows user interface. Microsoft

Visual Basic 6.0 that recently appears as one of the most popular programming language is chose. It provided standard windows object and graphic user interface that will make the program become user friendly.

Since Microsoft Visual Basic 6.0 is a high-level programming and have been designed to make it easy to create GUI applications, this project will used Microsoft Visual Basic 6.0 to create the GUI. More than that, Microsoft Visual Basic 6.0 applications can be integrated with the database and interact with hardware. As the world turn to GUI application, Microsoft Visual Basic 6.0 is one of the languages that changes to accommodate the shift.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter describes the methodology that is use in developing the project. The development involves three stages which is hardware development, software development and interfacing of both hardware and software.

3.2 Hardware Development

For the hardware development, the RFID system which consists of tag and reader was adjusted so that it can function according to the proposed application. The tag used in this project is passive tag and operates at frequency of 125 KHz. The passive tag is chosen for this project because it does not need power source as it is energized by the reader. More over it is cheap which only cost RM 3 per tag. The tag was stored with a unique code that identifies each user. There are many types of RFID tags which include card and key chain as shown in Figure 3.1. For this

project, the card tag is used because is it more suitable and easy to carry at anytime and anywhere. The card tag can be used as a smart card during entering UTM as shows in Figure 3.2.

Figure 3.1 The key chain and card type of RFID tags

Figure 3.2 The RFID Smart Card for the project

This RFID reader is used in this project which is also known as IDR-232 as shown in Figure 3.3. The IDR-232 has been designed with integrated RFID reader, antenna, LED, buzzer, power cable and data cable. It uses data rate of 9600 baud rate and RS232 serial interface. It is fully operation with 5V DC power supply. The buzzer is used as sound indication of activity and bi-color LED for visual indication of activity. It has 0.1second response time and operating frequency of 125 KHz which is same as the tag.

Figure 3.3 The RFID reader

The RFID reader has been tested with the tag to grab codes from the tag, decode it and send the code to the host computer. The test is done by connecting the RFID reader to the host computer. Since the host computer (notebook) did not have serial input, the RS 232 to USB converter is needed. The hyper terminal window will then opened and new connection was set with the properties same as shows by Figure 3.4.

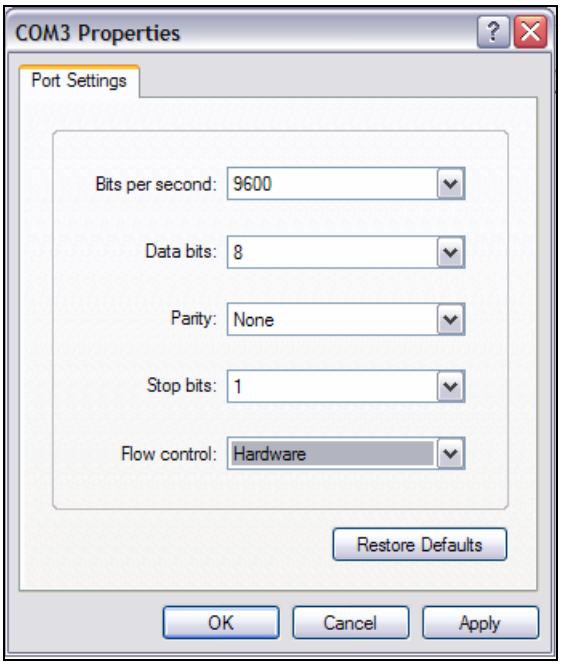


Figure 3.4 The properties of the hyper terminal communication

Then, the tag is place near to the RFID reader and the hyper terminal window show the unique code grab from the tag as shown in Figure 3.5. The hardware is working properly and the development process will move to the software part.

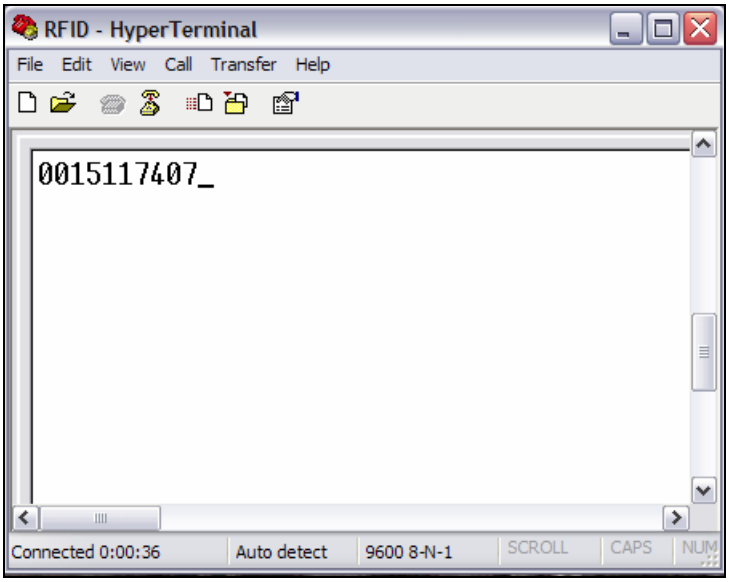


Figure 3.5 The hyper terminal shows the tag unique code

3.3 Software Development

The software development involves two things which are created the database to store the information and create the Graphic User Interface (GUI) to interface the system with user. The database is created using Microsoft SQL Server because it can be integrated with Microsoft Visual Basic 6.0, can ensure security, easy to manage and can store large number of user. GUI is created using Microsoft Visual Basic 6.0 because it can be integrated with the database and the hardware and also the programming for GUI can be created such user friendly.

3.3.1 Database

The database of this project stored all the information about the user of the system and the record of incoming traffic at the entrance. The database with server name of FAZLINA-663E7EB is created using Microsoft SQL Server and the connection properties is set as shows in Figure 3.6.

Figure 3.6 The connection properties of the database

Then, after connect the server of the database, the database name as StdEntrance is created to store all information needed for the system. The new table that store all the information can be created by right click at the tables at the object explorer and choose add new table. The object explorer of the server is shows in Figure 3.7. There are two tables created for this system. One of the tables is used to store information of the user includes the unique code, user name, UTM ID, user position, vehicle registration number, vehicle colour, vehicle type and vehicle manufacturer as shown in Figure 3.8. Another table is used to store the entry record of the UTM entrance include user name, UTM ID, user position, vehicle registration number, date and time as shown in Figure 3.9.

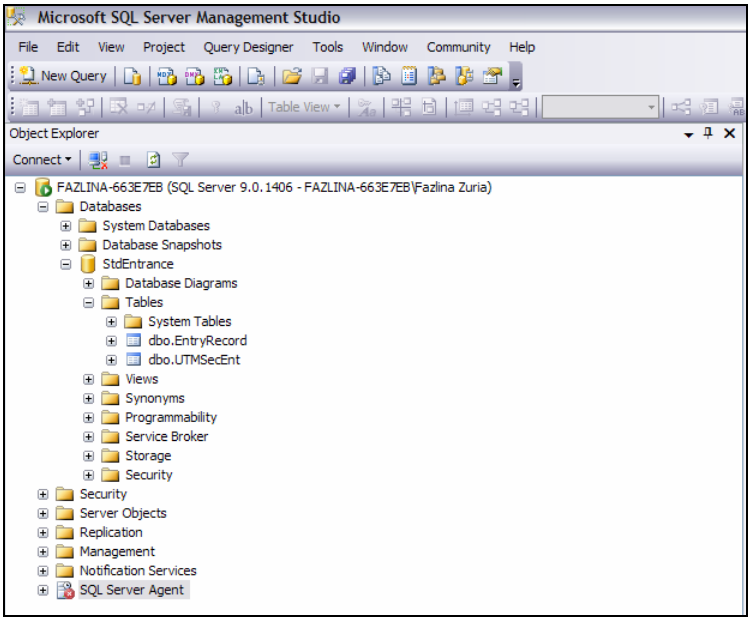
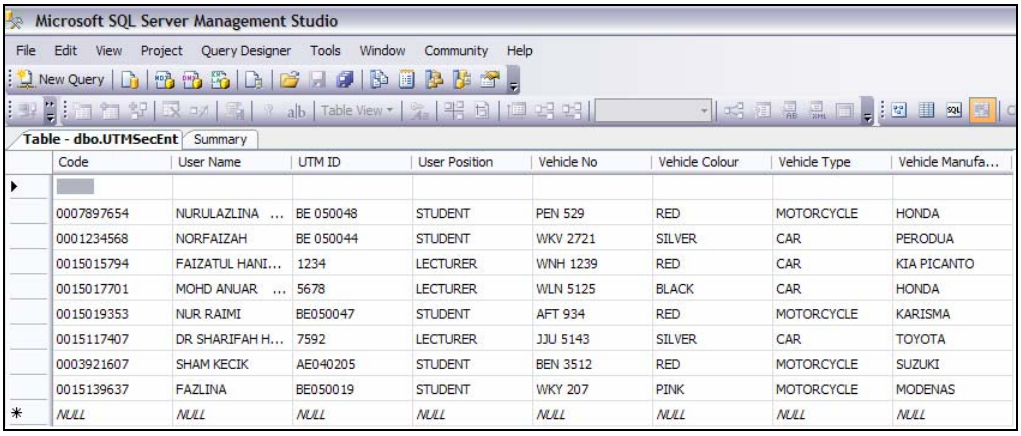
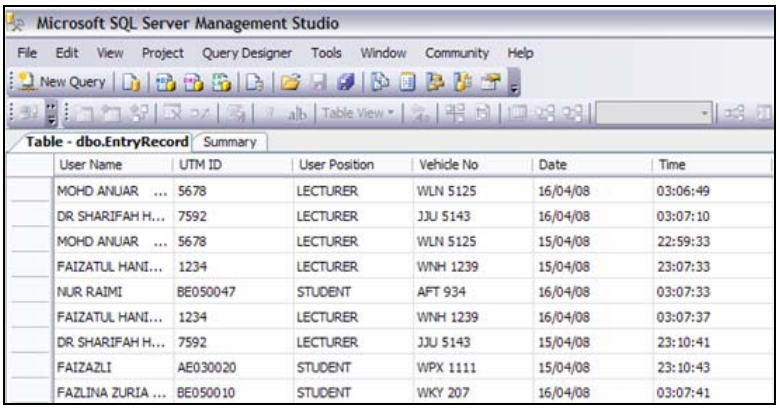


Figure 3.7 The object explorer of the server



Code	User Name	UTM ID	User Position	Vehicle No	Vehicle Colour	Vehicle Type	Vehicle Manufa...
0007897654	NURULAZLINA ...	BE 050048	STUDENT	PEN 529	RED	MOTORCYCLE	HONDA
0001234568	NORFAIZAH	BE 050044	STUDENT	WKV 2721	SILVER	CAR	PERODUA
0015015794	FAIZATUL HANI...	1234	LECTURER	WNH 1239	RED	CAR	KIA PICANTO
0015017701	MOHD ANUAR ...	5678	LECTURER	WLN 5125	BLACK	CAR	HONDA
0015019353	NUR RAIMI	BE050047	STUDENT	AFT 934	RED	MOTORCYCLE	KARISMA
0015117407	DR SHARIFAH H...	7592	LECTURER	JJU 5143	SILVER	CAR	TOYOTA
0003921607	SHAM KECIK	AE040205	STUDENT	BEN 3512	RED	MOTORCYCLE	SUZUKI
0015139637	FAZLINA	BE050019	STUDENT	WKY 207	PINK	MOTORCYCLE	MODENAS
NULL	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*

Figure 3.8 The table that store user information



User Name	UTM ID	User Position	Vehicle No	Date	Time
MOHD ANUAR ...	5678	LECTURER	WLN 5125	16/04/08	03:06:49
DR SHARIFAH H...	7592	LECTURER	JJU 5143	16/04/08	03:07:10
MOHD ANUAR ...	5678	LECTURER	WLN 5125	15/04/08	22:59:33
FAIZATUL HANI...	1234	LECTURER	WNH 1239	15/04/08	23:07:33
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	03:07:33
FAIZATUL HANI...	1234	LECTURER	WNH 1239	16/04/08	03:07:37
DR SHARIFAH H...	7592	LECTURER	JJU 5143	15/04/08	23:10:41
FAIZAZLI	AE030020	STUDENT	WPX 1111	15/04/08	23:10:43
FAZLINA ZURIA ...	BE050010	STUDENT	WKY 207	16/04/08	03:07:41

Figure 3.9 The table that store entry record of UTM entrance

3.3.2 Graphic User Interface (GUI)

The Microsoft Visual Basic 6.0 is used to create the GUI for this project. The important thing in designing the GUI is to make sure it can be integrated with the database and the hardware, hence can display the information of user when the tag is place near to the reader. Basic flowchart for the GUI design is shows in Figure 3.10.

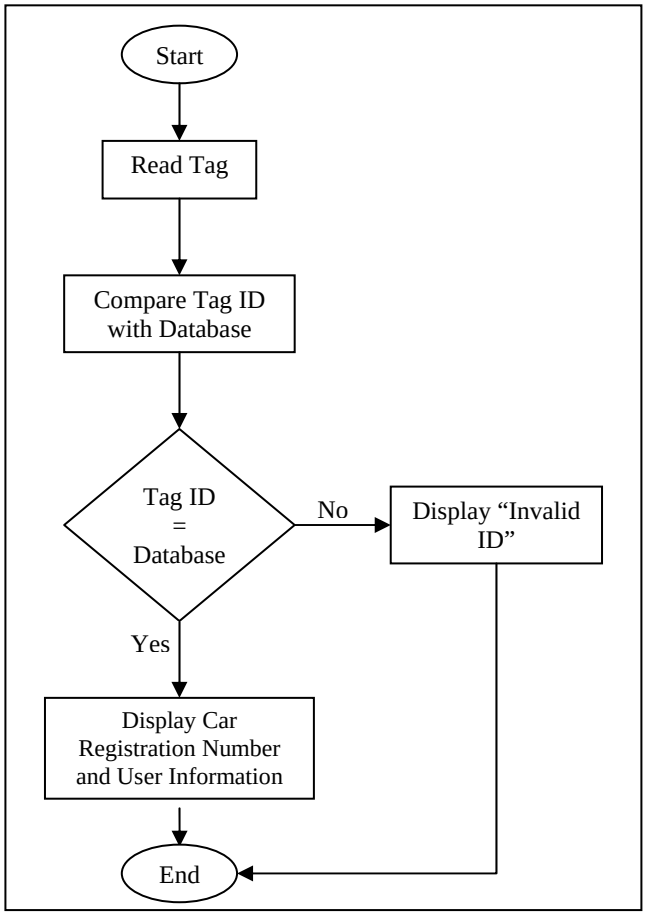


Figure 3.10 The flowchart of the programming

The design of the GUI is simulated until it gives desired output. Then, the GUI design to store the record entry in the database also created and the database is automatically updated every time user enters UTM. More than that, other option in the GUI that make the system is more user friendly also being created such as add

new user, delete user, view database, help, request for user manual and also print the record entry.

3.4 Interface

Figure 3.11 The connection of the system

The hardware and software is interface at the end of the project. Figure 3.11 shows the connection of the system from the reader to the host computer. A serial communication (RS-232) is used to connect the host computer to the RFID reader. Because of the host computer (notebook) didn't have the serial input, so the RS 232 to USB converter is used to connect the reader to the host computer. The reader also

connected to another one of the USB port to get the power supply. The project is successful and had given desired output. The results will be discussed in Chapter 4.

CHAPTER 4

RESULT

4.1 Introduction

This chapter describes the result after completing the project. Generally, the reader successful energized and grabs the unique code from the tags and then sent the unique code to the host computer. The host computer successful receives the unique code and compare with the database. The created GUI successful displays user information if the tag valid and displays “Invalid ID” if the tag is not valid. The block diagram of the UTM Security Entrance System is illustrated in Figure 4.1.

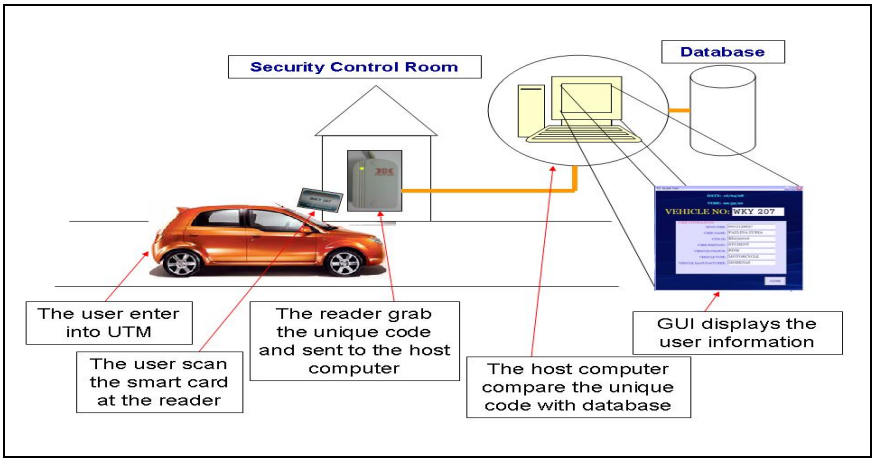

Security Control Room
Database
The user enter into UTM
The user scan the smart card at the reader
The reader grab the unique code and sent to the host computer
The host computer compare the unique code with database
GUI displays the user information

Figure 4.1 The block diagram of the project

Basically, the system operation start when there is a car enters into UTM. The owner of the car needs to place the RFID tag near to the RFID reader. The RFID reader will be located at the main entrance of UTM. Then, the reader will energized the tag and grab code from the tag and send the code to the host computer using serial interface.

The code then will be compared with the database by the GUI that has been created. After that, if the code of the card matched with the database, the GUI will display the car registration number. The security officer can compare the car registration number display by the host computer and the real car registration number. If the card did not match with the database, the GUI will display 'Invalid ID' and the security officer can stop the person from entering UTM. The security officer will only allow the authorized vehicle entering into UTM.

4.2 Graphic User Interface (GUI)

The GUI is created according to the proposed application and successful give the desired output. The details of each parts of the GUI will be discussed below.

4.2.1 Login

The login window is created to ensure the safety of the system and to make sure only administrator that have user name and password can log into the system. The administrator need to key in the username which is "nazuria" and the password

which is “kecik” and click login to log into the system. Figure 4.2 shows the login window of the system.

Figure 4.2 The login window

If the user key in invalid username and password, the message box that inform invalid login will appear as shows in Figure 4.3. User is supposed to enter the correct user name and password to log in into the system.

Figure 4.3 The invalid login message box

4.2.2 Main Menu

The main menu will appear after the user successful log into the system. The main menu window is created to give the user option in using the system. There are six buttons with different function at the main menu. User can click at any button to use the system according to their function. Figure 4.4 shows the main menu window of the system. The scan tag button is used when the user want to scan the tag on the reader. Error will occur if the tag is scanned at the reader without opening the scan tag window. The entry record button is used to view the entry record of the system. The add new user button is used to add new user to the system. The view database button is used to view the database of the system. The help button is used to view the user manual and description of the system. The exit button is used to exit from the system.

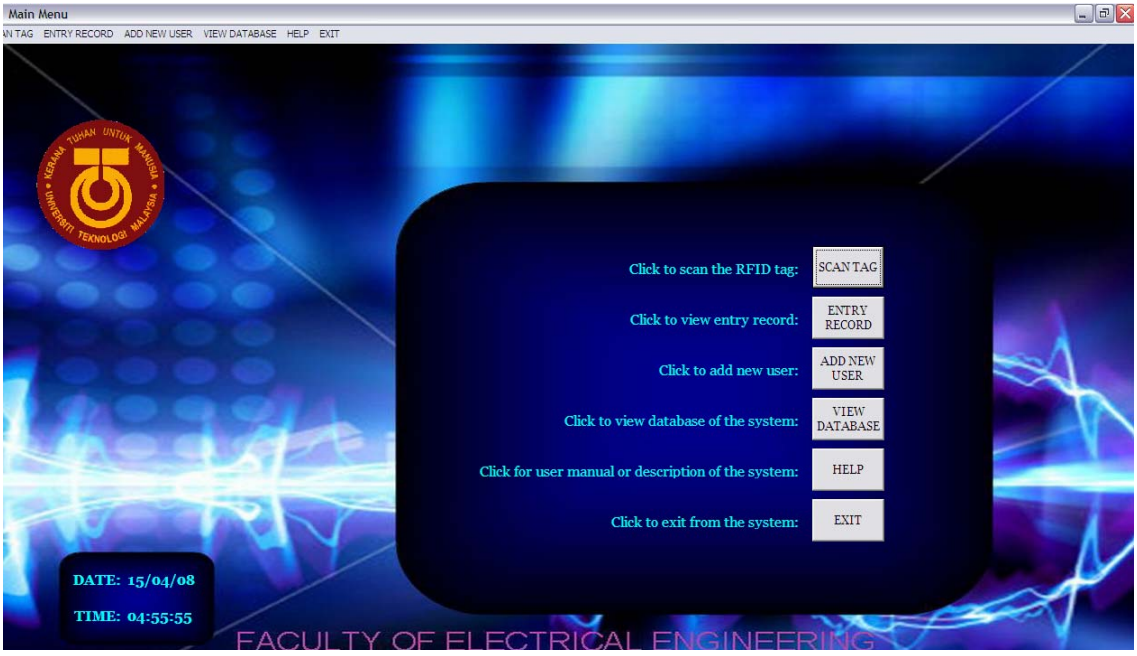


Figure 4.4 The main menu window

4.2.3 Scan Tag

The scan tag window is the important GUI in the project. It shows the result after the user scan the tag at the reader. The essential things are the GUI can receive the unique id from the tag and compare the unique id with the database. Error will occur if the tag is scanned at the reader without opening this window. The vehicle number and others user information will be displayed automatically after the user scan the tag at the reader if the user used the valid tag that is registered and store in the database. The user can click the close button to close the window. Figure 4.5 shows the window if the valid tag is scan at the reader.

Figure 4.5 The scan tag window

However, if the user scan the invalid tag, the message box that inform error occurs will appear as shows in Figure 4.6.

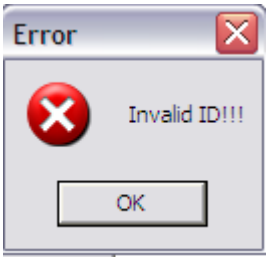
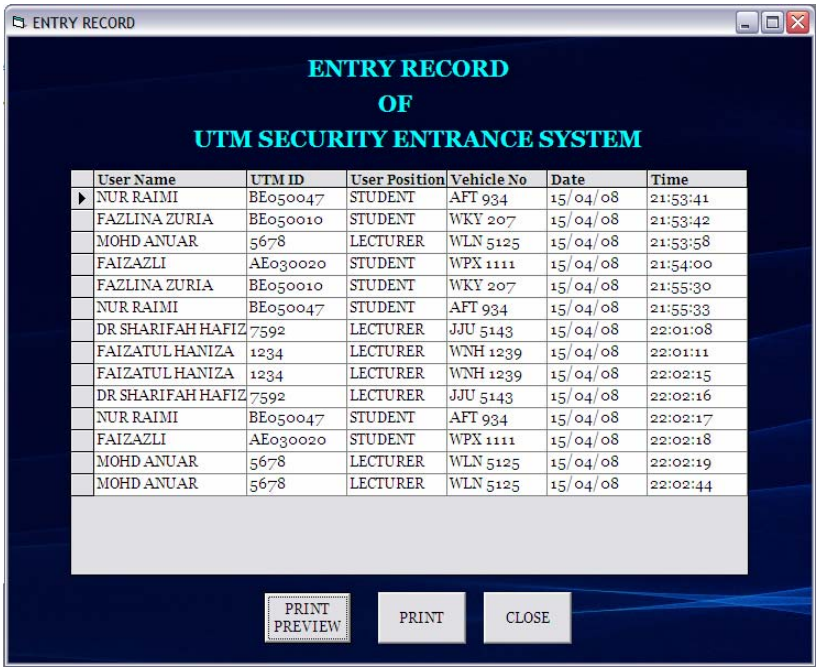


Figure 4.6 The error message box

4.2.4 Entry Record

The entry record window also one of the significant GUI in the project. It shows the entry record of the incoming traffic at the UTM entrance. The user information, date and time of the user enter UTM is stored in the database automatically as this window is updated. Figure 4.7 shows the entry record window that successful updated according to the date and time of the user scan the tag. The security officer can used this information for further reference if anything happens in UTM.



User Name	UTM ID	User Position	Vehicle No	Date	Time
NUR RAIMI	BE050047	STUDENT	AFT 934	15/04/08	21:53:41
FAZLINA ZURIA	BE050010	STUDENT	WKY 207	15/04/08	21:53:42
MOHD ANUAR	5678	LECTURER	WLN 5125	15/04/08	21:53:58
FAIZAZLI	AE030020	STUDENT	WPX 1111	15/04/08	21:54:00
FAZLINA ZURIA	BE050010	STUDENT	WKY 207	15/04/08	21:55:30
NUR RAIMI	BE050047	STUDENT	AFT 934	15/04/08	21:55:33
DR SHARIFAH HAFIZ	7592	LECTURER	JJU 5143	15/04/08	22:01:08
FAIZATUL HANIZA	1234	LECTURER	WNH 1239	15/04/08	22:01:11
FAIZATUL HANIZA	1234	LECTURER	WNH 1239	15/04/08	22:02:15
DR SHARIFAH HAFIZ	7592	LECTURER	JJU 5143	15/04/08	22:02:16
NUR RAIMI	BE050047	STUDENT	AFT 934	15/04/08	22:02:17
FAIZAZLI	AE030020	STUDENT	WPX 1111	15/04/08	22:02:18
MOHD ANUAR	5678	LECTURER	WLN 5125	15/04/08	22:02:19
MOHD ANUAR	5678	LECTURER	WLN 5125	15/04/08	22:02:44

Figure 4.7 The entry record window

More than that, there is also a print preview button that can be use by the security officer to see the print preview of the entry record and also print button to print out the entry record. The example of the print preview is shows in Figure 4.8. The close button is used to close the window.

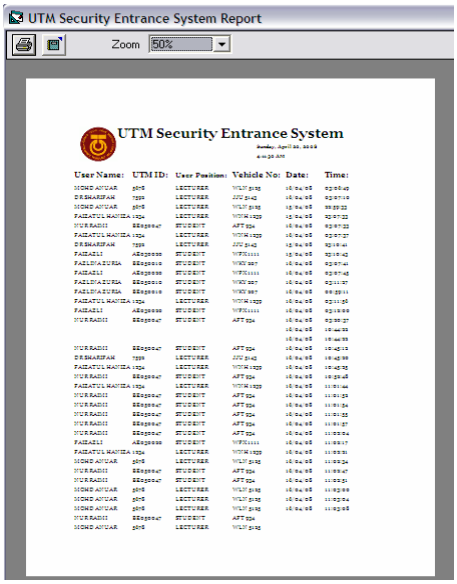


Figure 4.8 The example of the print preview

4.2.5 Add New User

A GUI is needed to add new user to the system. So, the add new user window is created to give easy way for the administrator to add new user to the system. The administrator need to fill in all the user information and then click the add new user button to add the new user to the system. The new user will automatically add to the database and the Microsoft SQL Server can store large number of user. After finish add new user, the administrator can view the database by click the view database button and can click close button to close the window. Figure 4.9 shows the add new user window.

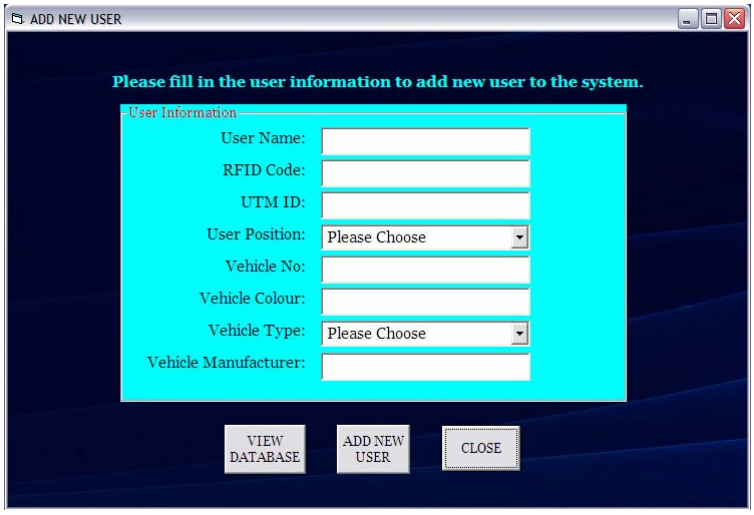


Figure 4.9 The add new user window

4.2.6 View Database

As mention earlier, the administrator can click the view database button to view the database of the system. So, this window will show the updated database of

the system. The administrator can select any user and click delete to delete the user from the database. The close button is used to close this window. Figure 4.10 shows the view database window.

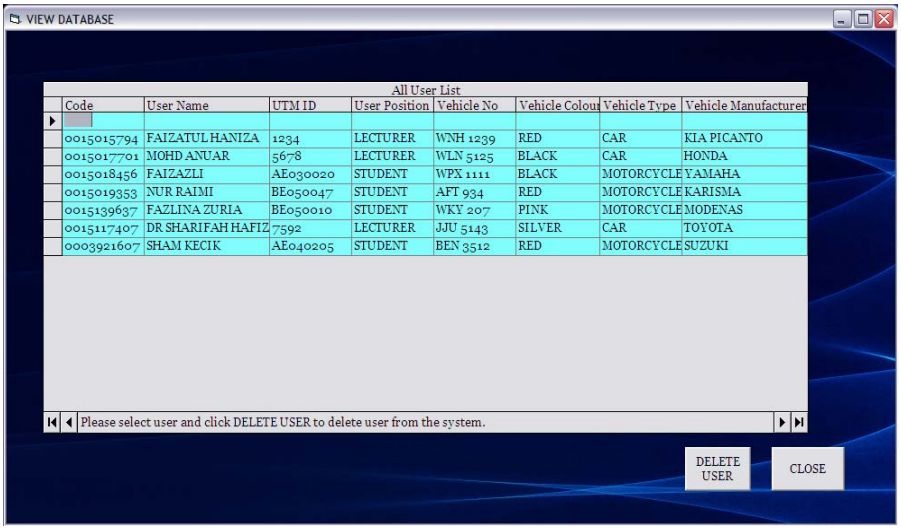

VIEW DATABASE
All User List
Code
User Name
UTM ID
User Position
Vehicle No
Vehicle Colour
Vehicle Type
Vehicle Manufacturer
0015015794 FAIZATUL HANIZA 1234 LECTURER WNH 1239 RED CAR KIA PICANTO
0015017701 MOHD ANUAR 5678 LECTURER WLN 5125 BLACK CAR HONDA
0015018456 FAIZAZLI AE030020 STUDENT WPX 1111 BLACK MOTORCYCLE YAMAHA
0015019353 NUR RAIMI BE050047 STUDENT AFT 934 RED MOTORCYCLE KARISMA
0015139637 FAZLINA ZURIA BE050010 STUDENT WKY 207 PINK MOTORCYCLE MODENAS
0015117407 DR SHARIFAH HAFIZ 7592 LECTURER JJU 5143 SILVER CAR TOYOTA
0003921607 SHAM KECIK AE040205 STUDENT BEN 3512 RED MOTORCYCLE SUZUKI
Please select user and click DELETE USER to delete user from the system.
DELETE USER
CLOSE

Figure 4.10 The view database window

4.2.7 Help

The help window is used when the user want to read the brief description about the system. The user also can click user manual button to get the user manual of the system. The close button is used to close the window. Figure 4.11 shows the help window.

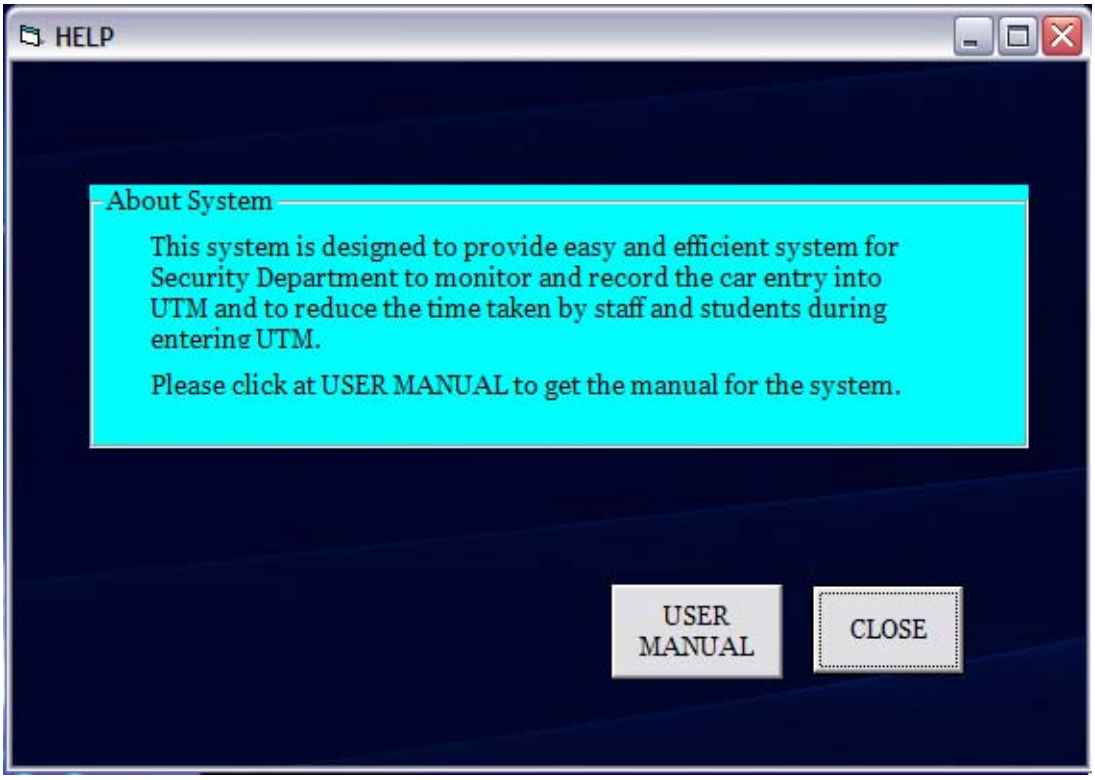

HELP
About System
This system is designed to provide easy and efficient system for Security Department to monitor and record the car entry into UTM and to reduce the time taken by staff and students during entering UTM.
Please click at USER MANUAL to get the manual for the system.
USER MANUAL
CLOSE

Figure 4.11 The help window

CHAPTER 5

DISCUSSIONS AND CONCLUSIONS

5.1 Introduction

This chapter describes the discussions and conclusions of the UTM Security Entrance using RFID project. In addition, some recommendations for further development is also included in this chapter.

5.2 Discussions and Conclusions

The development of the project had been done smoothly according to the planning until it is completed. Although there are some difficulties at the beginning of the development process such as, a beginner in both of the programming language used in this project, the project however managed to be completed and the desired result had been obtained.

The RFID system which includes the tag and reader had successful function according to the proposed application. The reader is able to grab the unique id from the tag that indicates every user of the system. The host computer also successful interfaces with the RFID system and can receive the unique id from the reader. The GUI programming successful communicates with both, the database and the RFID system. The GUI programming able to compare the unique id with the database and displays appropriate information. More than that, the GUI programming also can automatic record the information into the database every time user enters into UTM.

After completing this project, the objective of this project which is to develop an easy and efficient system for Security Department to monitor and record the car entry into UTM and also to reduce the time taken by staff and students during entering UTM had been achieved. This project had developed a system that is easy and efficient to monitor the UTM entrance which is simply by the user touch the tag to the reader compare to using manual system that have been mention earlier. The time taken by user to touch the tag is less than the time taken by the security officer to look and check the car number display at the car sticker. Hence, this will definitely reduce the time taken by staff and student during entering UTM.

In conclusion, the UTM Security Entrance using RFID System will not just omit the bottle neck at the entrance but also make a better record of UTM security system for the UTM Security Department.

5.3 Future Development

Some further work can be done to improve this project in the future such as place the RFID tag at the car sicker and also add the LCD displays as output of the system. The RFID tag can be place at the car sticker, but the system need an

external antenna to read the tag and must use higher frequency for the long range between the tag and the external antenna. Meanwhile, the LCD display need some circuit and controller and must be interface to the system using Visual Basic (GUI).

Instead of using passive RFID tag, active RFID tag is a good alternative to produce better security system that will ease the entering vehicle. They would not have to stop and touch the reader but can just pass by the reader. This is because active RFID tag can be read in farther distance than passive RFID tag.

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[5] Mohd. Shahizan Othman, Suraya Miskon, Syed Norris Hikmi Syed Abdullah, Norasnita Ahmad, and Roliana Ibrahim, *Microsoft SQL Server 2000*, UTM, Skudai, 2004

APPENDIX A

Programming for Login

```
Private Sub cmdLogin_Click()


   If txtusername.Text = "" Then
      MsgBox "Please enter the USERNAME!!!", 0 + 48, "Error"

      Exit Sub
   End If
   If txtpassword.Text = "" Then
      MsgBox "Please enter the PASSWORD!!!", 0 + 48, "Error"

      Exit Sub
   End If

   If txtusername.Text = "nazuria" Then

   If txtpassword.Text = "kecik" Then

   Unload Me
   Call Loading.Show

   Else
   txtusername.Text = ""
   txtpassword.Text = ""

   MsgBox "Please Try Again", 0 + 48, "Invalid Login"
   Login.Show
   End If
   End If

End Sub

Private Sub Form_Load()

End Sub

Private Sub Timer1_Timer()
Label8.Caption = Format(Date, "DD/MM/YY")
End Sub

Private Sub Timer2_Timer()
Label9.Caption = Format(Time, "HH:MM:SS")
End Sub
```

APPENDIX B

Programming for Loading

```
Private Declare Sub Sleep Lib "kernel32" (ByVal dwMilliseconds As Long)

Private Sub Form_Load()

   Timer1.Enabled = True
End Sub

Sub Progress(pb As Control, ByVal Percent)
Dim num$
If Not pb.AutoRedraw Then
   pb.AutoRedraw = -1
   End If
   pb.Cls
   pb.ScaleWidth = 100
   pb.DrawMode = 10
   num$ = Format$(Percent, "###") + "%"
   pb.CurrentX = 50 - pb.TextWidth(num$) / 2
   pb.CurrentY = (pb.ScaleHeight - pb.TextHeight(num$)) / 2
   pb.Print num$
   pb.Line (0, 0)-(Percent, pb.ScaleHeight), , BF
   pb.Refresh
End Sub

Private Sub lblMainMenu_Click()

End Sub

Private Sub Timer1_Timer()



   Picture1.ForeColor = vbBlue
   For X% = 0 To 100
   Sleep 50
   Progress Picture1, X%
   Next X%
   Timer1.Enabled = False
   Unload Me

  Mainmenu.Show

End Sub
```

APPENDIX C

Programming for Main Menu

```
Option Explicit

Private Sub cmdeditdatabase_Click()

   Call editdatabase.Show

End Sub

Private Sub cmdexit_Click()
   End

End Sub

Private Sub cmdhelp_Click()

   Call help.Show

End Sub

Private Sub cmdreport_Click()

   Call report.Show

End Sub

Private Sub cmdrfidreader_Click()

   Call rfidreader.Show

End Sub

Private Sub cmdview_Click()

   Call view.Show

End Sub

Private Sub Command1_Click()

   database.Show
End Sub

Private Sub Label1_Click()
```

```
End Sub

Private Sub mnueditdatabase_Click()

    editdatabase.Show
End Sub

Private Sub mnuexit_Click()

    End
End Sub

Private Sub mnuhelp_Click()

    help.Show
End Sub

Private Sub mnurfidreader_Click()

    rfidreader.Show
End Sub

Private Sub mnuview_Click()

    view.Show
End Sub

Private Sub Timer1_Timer()

    Label8.Caption = Format(Date, "DD/MM/YY")

End Sub

Private Sub Timer2_Timer()

    Label9.Caption = Format(Time, "HH:MM:SS")
End Sub

Private Sub Timer3_Timer()

    Label1.Visible = Not Label1.Visible
End Sub
```

APPENDIX D

Programming for Scan Tag

```
Const portnum As Integer = 5
Public Aline As String
Public flagIn As Boolean

Private Sub cmdback_Click()

   Unload Me
   Call Mainmenu.Show

End Sub

Private Sub Form_Load()
Dim vntBookmark As Variant

   flagIn = False
   With MSComm1
   If .PortOpen = False Then
      .CommPort = 5
      .Settings = "9600,n,8,1"
      .RThreshold = 1
      .RTSEnable = True
      .InputLen = 1
      .PortOpen = True
   End If
   End With

Form_load_exit:
      Exit Sub

err_exit:
      MsgBox "Unable to Open Comm Port", vbCritical, "CommPort Error"

End Sub

Private Sub MSComm1_OnComm()

   Dim Achar As String

   Achar = MSComm1.Input
   Aline = Aline & Achar
   txtTag.Text = Aline

   If Len(Aline) = 10 Then
```

```
        With AdoRecord.Recordset
           vntBookmark = .Bookmark
           .MoveFirst
           .Find "Code Like " & Aline & ""
        End With

        If AdoRecord.Recordset.EOF Then
           MsgBox "Invalid ID!!!", vbCritical, "Error"
           AdoRecord.Recordset.Bookmark = vntBookmark
        End If

        If Text1.Text = "" Then
        AdoEntrance.Recordset.AddNew
        AdoEntrance.Recordset.Fields("User Name") = Text2.Text
        AdoEntrance.Recordset.Fields("UTM ID") = Text3.Text
        AdoEntrance.Recordset.Fields("User Position") = Text4.Text
        AdoEntrance.Recordset.Fields("Vehicle No") = Text8.Text
        AdoEntrance.Recordset.Fields("Date") = label10(0).Caption
        AdoEntrance.Recordset.Fields("Time") = Label9.Caption
        AdoEntrance.Recordset.Update
        End If

        Aline = ""
    End If

End Sub

Private Sub Form_UnLoad(Cancel As Integer)

    If MSComm1.PortOpen = True Then
        MSComm1.PortOpen = False
    End If

End Sub

Private Sub Timer1_Timer()
label10(0).Caption = Format(Date, "DD/MM/YY")
End Sub

Private Sub Timer2_Timer()
Label9.Caption = Format(Time, "HH:MM:SS")
End Sub
```

APPENDIX E

Programming for Entry Record

```
Option Explicit

Private Sub cmdback_Click()

    Unload Me
    Call Mainmenu.Show
End Sub

Private Sub Command1_Click()

    rptEntrance.PrintReport

End Sub

Private Sub Command2_Click()

    Adodc1.Recordset.Update
    rptEntrance.Show

End Sub

Private Sub Form_Load()

End Sub
```

APPENDIX F

Programming for Add New User

```
Option Explicit

Private Sub cmdback_Click()

    Unload Me
    Call Mainmenu.Show
End Sub

Private Sub VScroll1_Change()

End Sub


Private Sub Command1_Click()

    If Text1.Text = "" Then
        MsgBox "Please enter the USERNAME!!!", 0 + 48, "Error"

        Exit Sub
    End If

    If Text2.Text = "" Then
        MsgBox "Please enter the RFID Code!!!", 0 + 48, "Error"

        Exit Sub
    End If

    If Text3.Text = "" Then
        MsgBox "Please enter the UTM ID!!!", 0 + 48, "Error"

        Exit Sub
    End If

    If Text4.Text = "" Then
        MsgBox "Please enter the Vehicle No!!!", 0 + 48, "Error"

        Exit Sub
    End If

    If Text5.Text = "" Then
        MsgBox "Please enter the Vehicle Colour!!!", 0 + 48, "Error"

        Exit Sub
    End If
```

```
   If Text7.Text = "" Then
      MsgBox "Please enter the Vehicle Manufacturer!!!", 0 + 48, "Error"

      Exit Sub
   End If


      Adodc1.Recordset.AddNew
      Adodc1.Recordset.Fields("User Name") = Text1.Text
      Adodc1.Recordset.Fields("Code") = Text2.Text
      Adodc1.Recordset.Fields("UTM ID") = Text3.Text
      Adodc1.Recordset.Fields("User Position") = Combo1.Text
      Adodc1.Recordset.Fields("Vehicle No") = Text4.Text
      Adodc1.Recordset.Fields("Vehicle Colour") = Text5.Text
      Adodc1.Recordset.Fields("Vehicle Type") = Combo2.Text
      Adodc1.Recordset.Fields("Vehicle Manufacturer") = Text7.Text

      MsgBox "Successful add new user to the system!!!", vbExclamation, "Thank
You"

End Sub



Private Sub Command3_Click()
   Unload Me
   database.Show
End Sub

Private Sub Form_Load()

End Sub
```

APPENDIX G

Programming for View Database

```
Option Explicit

Private Sub Command1_Click()

   Unload Me
   Call Mainmenu.Show
End Sub

Private Sub Command2_Click()

 Adodc1.Recordset.Delete
   If Not Adodc1.Recordset.EOF Then
        Adodc1.Recordset.MovePrevious
   End If

End Sub

Private Sub DataGrid1_Click()

End Sub
```

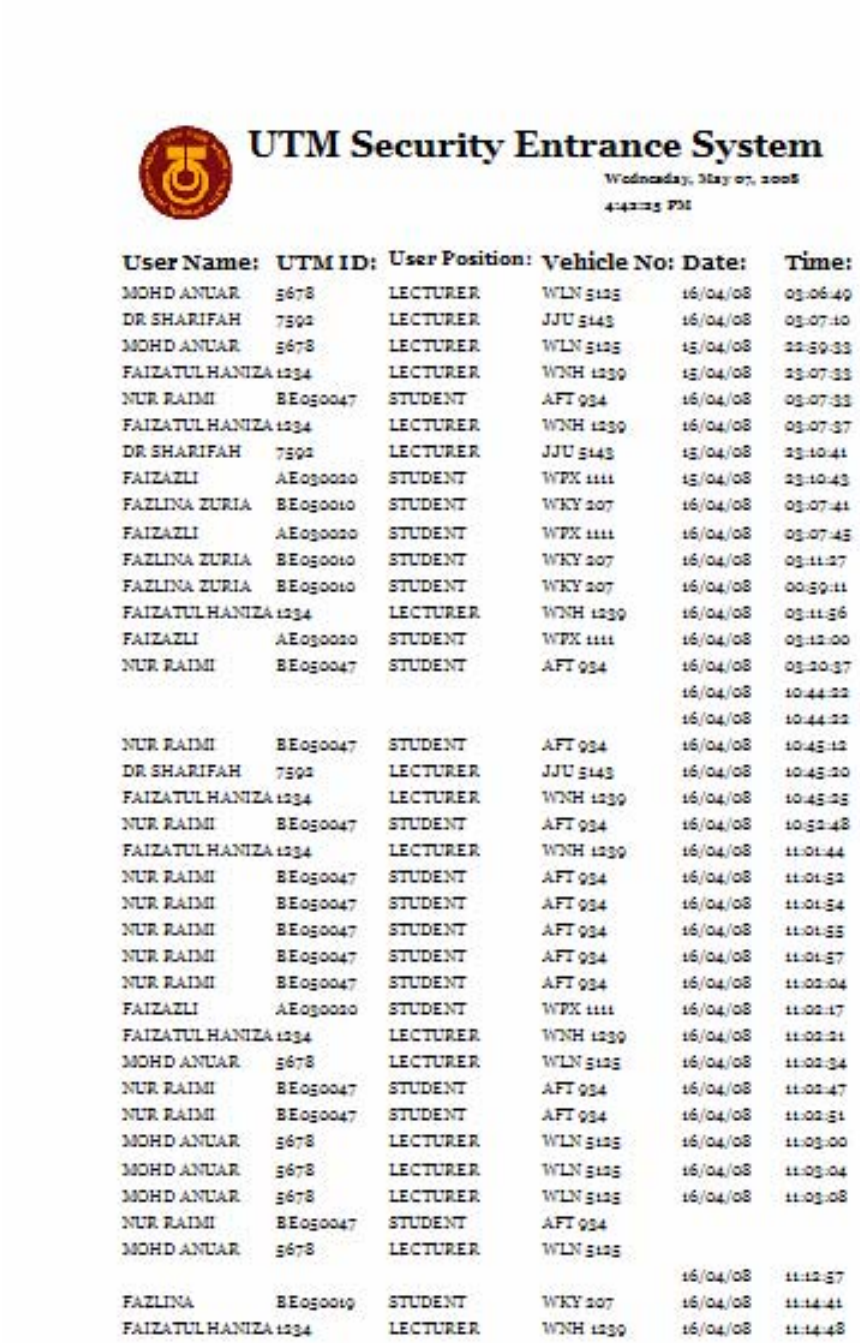
APPENDIX H

Programming for Help

```
Option Explicit

Private Sub cmdback_Click()

   Unload Me
   Call Mainmenu.Show
End Sub

Private Sub Command1_Click()
Call getpdf(App.Path & "\user manual.pdf", Me.hwnd)
End Sub

Private Sub Label1_Click()

End Sub
```

APPENDIX I

The print preview of Entry Record



UTM Security Entrance System

Wednesday, May 07, 2008
4:42:25 PM

User Name:	UTM ID:	User Position:	Vehicle No:	Date:	Time:
MOHD ANUAR	5678	LECTURER	WLN 5125	16/04/08	03:06:49
DR SHARIFAH	7592	LECTURER	JJU 5143	16/04/08	03:07:10
MOHD ANUAR	5678	LECTURER	WLN 5125	15/04/08	22:59:33
FAIZATUL HANIZA	1234	LECTURER	WNH 1239	15/04/08	23:07:33
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	03:07:33
FAIZATUL HANIZA	1234	LECTURER	WNH 1239	16/04/08	03:07:37
DR SHARIFAH	7592	LECTURER	JJU 5143	15/04/08	23:10:41
FAIZAZLI	AE050020	STUDENT	WPX 1111	15/04/08	23:10:43
FAZLINA ZURIA	BE050010	STUDENT	WKY 207	16/04/08	03:07:41
FAIZAZLI	AE050020	STUDENT	WPX 1111	16/04/08	03:07:45
FAZLINA ZURIA	BE050010	STUDENT	WKY 207	16/04/08	03:11:27
FAZLINA ZURIA	BE050010	STUDENT	WKY 207	16/04/08	00:59:11
FAIZATUL HANIZA	1234	LECTURER	WNH 1239	16/04/08	03:11:36
FAIZAZLI	AE050020	STUDENT	WPX 1111	16/04/08	03:12:00
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	03:20:37
				16/04/08	10:44:22
				16/04/08	10:44:22
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	10:45:12
DR SHARIFAH	7592	LECTURER	JJU 5143	16/04/08	10:45:20
FAIZATUL HANIZA	1234	LECTURER	WNH 1239	16/04/08	10:45:25
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	10:52:48
FAIZATUL HANIZA	1234	LECTURER	WNH 1239	16/04/08	11:01:44
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	11:01:52
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	11:01:54
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	11:01:55
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	11:01:57
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	11:02:04
FAIZAZLI	AE050020	STUDENT	WPX 1111	16/04/08	11:02:17
FAIZATUL HANIZA	1234	LECTURER	WNH 1239	16/04/08	11:02:21
MOHD ANUAR	5678	LECTURER	WLN 5125	16/04/08	11:02:34
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	11:02:47
NUR RAIMI	BE050047	STUDENT	AFT 934	16/04/08	11:02:51
MOHD ANUAR	5678	LECTURER	WLN 5125	16/04/08	11:03:00
MOHD ANUAR	5678	LECTURER	WLN 5125	16/04/08	11:03:04
MOHD ANUAR	5678	LECTURER	WLN 5125	16/04/08	11:03:08
NUR RAIMI	BE050047	STUDENT	AFT 934		
MOHD ANUAR	5678	LECTURER	WLN 5125		
				16/04/08	11:12:57
FAZLINA	BE050019	STUDENT	WKY 207	16/04/08	11:14:41
FAIZATUL HANIZA	1234	LECTURER	WNH 1239	16/04/08	11:14:48